

NREPS Applications for Water Supply and Management in California and Tennessee

Management of water resources is a balancing act between temporally and spatially limited sources and competitive needs which can often exceed the supply. In order to manage water resources over a region such as the San Joaquin Valley or the Tennessee River Valley, it is pertinent to know the amount of water that has fallen in the watershed and where the water is going within it. Since rain gauge networks are typically sparsely spaced, it is typical that the majority of rainfall on the region may not be measured. To mitigate this under-sampling of rainfall, weather radar has long been employed to provide areal rainfall estimates. The Next-Generation Weather Radars (NEXRAD) make it possible to estimate rainfall over the majority of the conterminous United States. The NEXRAD Rainfall Estimation Processing System (NREPS) was developed specifically for the purpose of using weather radar to estimate rainfall for water resources management. The NREPS is tailored to meet customer needs on spatial and temporal scales relevant to the hydrologic or land-surface models of the end-user. It utilizes several techniques to mitigate artifacts in the NEXRAD data from contaminating the rainfall field. These techniques include clutter filtering, correction for occultation by topography as well as accounting for the vertical profile of reflectivity. This presentation will focus on improvements made to the NREPS system to map rainfall in the San Joaquin Valley for NASA's Water Supply and Management Project in California, but also ongoing rainfall mapping work in the Tennessee River watershed for the Tennessee Valley Authority and possible future applications in other areas of the continent.